INDIRA GANDHI NATIONAL OPEN UNIVERSITY

REACHING E-LEARNING TO THE UNREACHED THROUGH TECHNOLOGY ENHANCED OPEN LEARNING (TEOL)

Submitted for adoption and Implementation in all Education Programs of IGNOU by

K.R. Srivathsan, 02 Aug. 2010

1. WHY TECHNOLOGY ENHANCED OPEN LEARNING (TEOL)?

The time has come for IGNOU to move forward and evolve from the present printed materials centered system of ODL to one that integrates relevant and approved e-content and web-resources into its learning materials and formal ICT enabled instruction delivery, learning management, students assessment and evaluation processes. No doubt there has been some not-so-formal use of ICT facilities in IGNOU like telecasting, teleconferences, community radio, eGyankosh, Ignouonline, website, email and bulk sms services. However, the instruction delivery and evaluation processes have remained largely manual. Our present ways of using Learning Management System (LMS) like Moodle are neither readily scalable nor adequately fit into most of the present systems and practices of IGNOU. It caters to only a tiny fraction of IGNOU's learners. Further it is not aligned with the ways IGNOU manages most of its programs with vast numbers of through the community of program and courses coordinators, Regional Centres, Study Centres, academic counselors and other field level engagement of its learners.

What IGNOU needs is its own e-learning approach where the ICT supports systems and processes that evolve from and align with our own traditions and strong points of programs development and education management. We may recall that the framework for such a system was enunciated as 'Open Distributed Technology Enhanced Learning (ODTEL)' in June 2009. The same was approved by the Academic Council in its 43rd meeting of Academic Council held on June 2009. It was passed by the Board of Management in its 100th meeting held on July 04, 2009. The ODTEL Framework paper was widely circulated to all in IGNOU in Oct. 2009. It may be downloaded from the ODTEL Wiki area (http://iocg.ignou.ac.in/wiki), or the following link.

http://iocg.ignou.ac.in/wiki/images/7/7f/Invitation-ODTEL-102k9.pdf

We shall refer hereafter the ODTEL Framework as the **'Technology Enhanced Open Learning (TEOL)'** system of IGNOU. TEOL preserves all the good features, strengths and programs management systems of the present IGNOU's ODL system. It adds many more ICT supported capabilities, greater coherence in the various aspects of program management and removes most of the weaknesses in the existing printed materials based learning and evaluation system.

TEOL addresses two major requirements of IGNOU. First is that it is aligned with its existing system of schools, program coordinators, regional services, study centres, counselors and students who are spread out over vast geography. Secondly, It takes cognizance of integrating our global developments

like the NPTEL, Open Courseware, scientific databases, learning objects repositories, open access publishing, linked libraries, etc. IGNOU has no choice but to take cognizance of the times and command the adaptations of its systems and processes that fit into the new era of Internet, multimedia, mobile and the vast growing volumes and developments of web-resources. TEOL is intended to fill this requirement. TEOL is intended as IGNOU's own virtual open e-learning platform that supports the many programs of IGNOU with vast enrollments and managed through hundreds of study centres spread across the country. At present IGNOU does not have a properly architected, disciplined and managed e-learning support for 99% or more of IGNOU's registered students. Conventional LMS based approaches without the students equipped to access and participate in online interactions just do not meet this requirement. TEOL is intended to fulfill this large vacuum.

TEOL as a system supports capabilities whereby subject matter experts and course authors of IGNOU may stitch together or, 'mash-up' contents and resources (in the web 2.0 sense) from diverse web-accessed or online sources into learning modules. TEOL anticipates students using new mobile devices, e-book readers, wikibooks, and emerging frameworks like the OCW-2 that allow community annotations and building up of content and comments over course materials. TEOL will encourage such new age programs development. It will open up and promote innovations in IGNOU to formally integrate rich content and web-resources into its programs. This will allow new kinds of programs and programs management to be adopted for the coming times.

TEOL will empower the vast numbers of IGNOU's learners and counselors who are currently not equipped beyond intermittent access to Internet through access points like study centres and kiosks. TEOL promotes and supports disciplined and contextualized uses of multiple modes of reaching and engaging the learners through TV, Mobile, Community Radio, Webinar, and potential innovative ways of reaching and engaging the learners, coordinators and counselors.

The overall aims of TEOL are to (i) bring disciplined and scalable ICT facilitation to the growing numbers of IGNOU's learners set over the IGNOU context of programs registration and education management, and (ii) enhance quality assurance and the accreditation worthiness of IGNOU's courses and programs. It has the potential to excel the present regular classroom system of education in the multitude of programs conducted in different ways like in its regular programs and those with partner organizations, community colleges, online modes, etc. TEOL is intended to address the 'Janata' classes of the vast number of less endowed users and yet bring out much of the advantages of ICT enabled support. Further it is well aligned with emerging multiple modes of reaching and engaging learners through ICT support that are at the disposal of the programs and courses coordinators.

2. TEOL RELATED DEVELOPMENTS

TEOL is designed to address the challenge of IGNOU to provide e-learning support in a framework that is aligned with its system of schools, program coordinators, regional services, study centres, counselors and students who are spread out over vast geography. It also takes cognizance of global developments like the NPTEL, Open Courseware, scientific databases, learning objects repositories, open access publishing, linked libraries, etc.

Considerable conceptualization, consultation, design, development and trial deployment works related to TEOL have been carried out by a dedicated team of young consultants and fresh graduates under the ACIIL. Wide ranging one-on-one and group discussions have been held with different IGNOU staff, faculty, the schools, centres and divisions on the approach and the component functions in the system.

Currently there are 28 programs and about 200 courses therein have basic TEOL support capabilities. Several IGNOU faculty and senior staff from the various schools and divisions have given constructive inputs to shape the TEOL. *Through this document, we announce TEOL as a formal system of augmenting IGNOU's ODL for all its programs and the courses therein with supportive open and flexible e-learning.* We delineate below what TEOL is, list the several advantages to IGNOU, its programs coordination and learner support services provided by the adoption of TEOL.

Here we emphasize what TEOL is not. TEOL should not be mistaken for one more e-learning platform or tool that may be used by a program or course coordinator like the way we take to TV channel, eGyankosh, webinar, Adobe Connect, Moodle, SMS and such component IT systems or facilities. However each of them may be used as a part of the larger TEOL system. Just because it has a front end page that is implemented on a Wiki with suitable extensions, it should not be mistaken for a Wiki system or seen as a Wikipedia type utility.

We should take efforts to understand TEOL from the totality of IGNOU's ways of management, coordination and interactions amongst the coordinators, study centres, counselors, learners and regional services as required in supporting the present ODL programs of IGNOU.

3. ON TEOL AND ICT SUPPORTED FORMAL EDUCATION PROCESSSES

TEOL facilitates each course in a program to conduct effectively pedagogically aligned ICT supported learning services for its students. It is possible to do these in ways that assure quality learning support to students in each course under every program. It is relevant for all programs – whether with very large enrollments or those with small numbers as in regular classes or online modes that use LMS. To appreciate TEOL, we should note that in all programs with large enrolments IGNOU has to contend with instruction teams that have hundreds of unknown counselors across countrywide study centres. There is no direct control of the instruction delivery and learning engagement processes by the program and courses coordinators. The full database of counselors and registered students in the program study centres are not wholly known till sometime elapses after the commencement of courses. For most programs, particularly with large enrollments, IGNOU adopts a hierarchically federated program management structure with study centres at the contact and delivery end. The Regional Centres monitor the Study Centres on issues concerning contact classes, counseling and formative evaluation.

TEOL is architected to serve this scenario of 'not fully known instruction team' to support e-learning activities for the 'not so fully known students' in their own places. The vast majority of IGNOU's learners may not have the requisite quality of Internet access to effectively use LMS and conventional

type of e-learning systems. TEOL will be of great value even in such situations. In most cases the list of counselors and their contact details are not completely known to the Regional Centres.

We may refer to the IGNOU's TEOL system as a unified open e-learning support for all modes of education – conventional classroom centered kind, tutored video instruction kind, the present printed self-learning materials based instruction delivery or potential future highly interactive web-portal supported interactive and blended modes of courses study and participation. Our TEOL is well aligned with the emerging open education possibilities enunciated in [2]. Besides streamlining ICT processes of programs support, it provides the freedom and flexibility to use 'ignouonline' Moodle services in the backend. We strongly advise that programs hosted in ignouonline also set up the TEOL system to benefit from its added advantages. The programs therein will get wider publicity, evoke much more interest and attract learners by using this approach.

To establish TEOL with its ICT driven processes we have to declare it as integral and formal part of IGNOU's programs development, management and the way we conduct the courses in IGNOU. TEOL has been developed for IGNOU to enhance and command the ODL for the emerging times. Hence we have to understand the new challenges, methodologies and systems arising from the rich course support systems of TEOL and integrate them into the formal processes of IGNOU.

TEOL allows a gentle evolution of existing formal processes and practices in IGNOU in its programs management. It is inclusive in involving the schools/centres, School Boards, Academic Council, Planning & development Division, the Regional Services, the Registration and Evaluation Divisions to play their respective roles in the program management. TEOL framework affects all of them positively and adds great benefits to the whole of IGNOU and its learners. It is aligned with and evolves from the processes of program management that are already in vogue at IGNOU. This should help in accepting the new system and master the same readily by all concerned.

The present processes of programs and courses management in IGNOU centered on paper, printed materials, study centres and SRD/SED are somewhat confused and not adequate to manage the ever growing numbers of learners. They need to be updated by taking into account disciplined use of ICT as supported by the TEOL. Our present ODL management is also slowly getting distanced from the learners needs. With increasing penetration of Internet, 3G and advanced mobile services, IP-TV, new modes of Community Radio usages, etc., IGNOU can no longer wait to bring multimedia, video and social networking aspects of ICT integrated into its formal education system. TEOL provides a way to achieve this.

In summary, TEOL may be viewed as a web-accessed program-centric disciplined <u>community driven collaborative open e-learning ecosystem</u>. Subject Matter Experts may customize the online components of TEOL for each program. It makes efficient the federated hierarchical system of programs management in IGNOU. Each player in the education delivery and management - the Program Coordinator, associated course coordinators, the academic counselors, Regional Services, Registration and Evaluation Divisions and the learners – has the respective role in TEOL system of program management and the conduct of the courses related activities therein.

IGNOU's present problems in effective and credible students' registration, courses management, and evaluation largely arise from the non-adoption of formal ICT supported processes within and across the divisions and schools. The schools and divisions work in compartments without themselves relating to each other (except through office files and informal email) to assure appropriate and effective students centric processes. Present protocols of responsibilities in information exchange, responsive and timely action between the schools and divisions are weak. Here we propose two major suites of systems developments that will unite the schools and divisions effectively through modern ICT supported practices and processes. These will assure results oriented and learners centered programs and courses management. The two suites of systems that IGNOU must have are:

1. **The TEOL Framework of Open e-Learning (TEOL).**
2. **The Students Registration and Records Management Services (SRRMS).**

Here we are concerned with launching the first, i.e., TEOL without delay. TEOL is currently developed enough for deployment and use. It is focused on systems that support the academic management and learner interactions aspects of IGNOU's programs. It will further evolve from collective experience. SRRMS is concerned with the administrative and related support services for the programs. SRRMS will require the SRD, SED and RSD to concur on the approach and collaboratively work. It is not possible to touch the second until we come out of the multiple data entry system between these divisions without an online accessed core database system and supported processes that is maintained professionally.

The present problems of IGNOU arise from weak use of formal systems of ICT or professional understanding of the same in the IGNOU's SRD, SED, RSD and CD with respect to student-records, related services and processes management. What are called software in IGNOU are largely many small patch up utilities used for data entry and collation work that are managed in isolation by the staff in the different divisions. They do not constitute a database system. There is poor understanding of formal database systems in IGNOU. This has to be transcended first. We shall take up the approach to developing the SRRMS in another paper.

4. TEOL FRAMEWORK

We have to appreciate that IGNOU has no choice but to move forward with the times and adapt itself to the use of ICT in both formal and informal ways that empower the coordinators, the regional services, study centers and academic counselors so that they in turn engage the learners in processes that assure quality education. TEOL is designed to address this issue. The concepts underlying the TEOL are explained in [1]. For each program, TEOL is implemented through multi-layered services approach. This is illustrated in Fig. 1. The layered approach follows the natural navigation instincts of the different players in the community of coordinators, counselors, learners and administrative personnel in each program.

There are specific reasons for adopting the layered services based open e-learning approach. Firstly, it is inclusive of all ICT modes of engaging with the learners. Once users gain some familiarity, each category in the community, i.e., the coordinator, the counselor, the students, those potentially interested

knowing about the program or the course, the coordinator of a study centre, the staff in the Regional Centre, etc., each will be able to readily navigate to the page or area wherefrom they access and perform their respective ICT enabled function. Our aim is to provide maximum ICT facilitations to manage the program and the courses therein, particularly for those programs with very large enrollment.
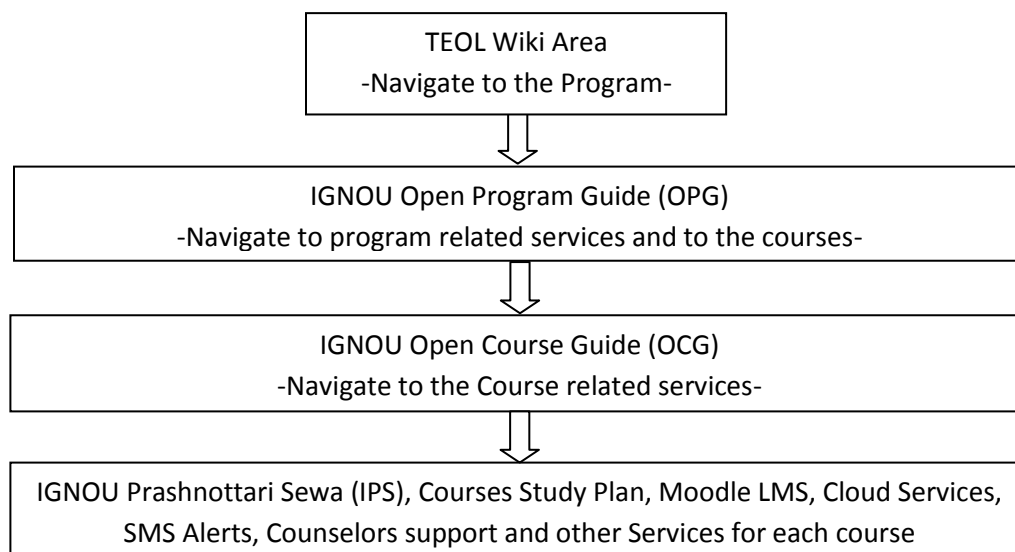
```
┌─────────────────────────────────────┐
│          TEOL Wiki Area             │
│     -Navigate to the Program-       │
└─────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────────────────────┐
│        IGNOU Open Program Guide (OPG)               │
│  -Navigate to program related services and to the   │
│                  courses-                           │
└─────────────────────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────────────────────┐
│        IGNOU Open Course Guide (OCG)                │
│     -Navigate to the Course related services-       │
└─────────────────────────────────────────────────────┘
                  ↓
┌─────────────────────────────────────────────────────┐
│ IGNOU Prashnottari Sewa (IPS), Courses Study Plan,  │
│ Moodle LMS, Cloud Services, SMS Alerts, Counselors  │
│   support and other Services for each course        │
└─────────────────────────────────────────────────────┘
```
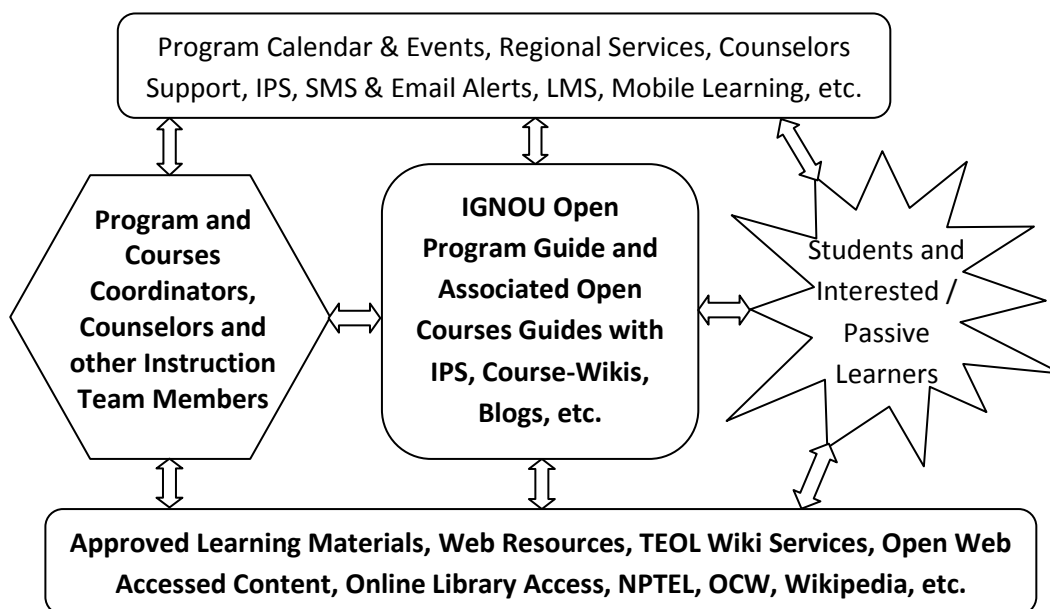
Fig. 1: TEOL Layers of Services

Fig. 2: TEOL System of Open e-Learning and Multimodal Support Services

The TEOL system is IGNOU's own innovation in education management structured as open community driven e-learning. It is both useful and powerful to add much value for IGNOU's vast numbers of learners even if they only have intermittent access to Internet and mobile services by empowering the program coordinator, the courses coordinators, the counselors and study centre coordinators to interact with each other and reach over to the learners. The Regional Centres will be much better equipped through the distributed open counseling supported by the TEOL. Program and course coordinators have several utilities to guide and interact with the unknown counselors through the social networking supported by wikis and IPS driven approaches.

We illustrate in Fig. 3 the system of Open e-Learning in courses under the provided by the TEOL. As may be gleamed from it, TEOL consists of a suite of systems and processes that assure quality instruction and learning management that are managed and moderated through the central TEOL wiki and IPS systems. Each program is provided with an **Open Program Guide (OPG).** OPG is an open wiki page with several functional components. Some of the key functional components in this are given below.

> (i) Program header area that declares the program title, the program code, the program coordinator and his/her contact details, who offers the program, etc. It also provides the links to the Open Program Blog, and the IPS.
>
> (ii) Program Events and Announcements.
>
> (iii) Facilities for program registration and download of forms for various purposes.
>
> (iv) Program Guide.
>
> (v) Program objectives, structure, eligibility and description.
>
> (vi) Fee structure and important dates.
>
> (vii) List of courses in the program and links to their respective Open Course Guides.

Other functional component areas may be added in due course as deemed fit in future. OPG will help the Regional Centres to counsel students and new interested learners as it will provide online information on all aspects connected with the community at large and the students in the program. The IPS provides channels for interactions for anyone interested in the program to query and get assured response from the concerned coordinator or other services wings of IGNOU concerned.

The next key area is the IGNOU Open Course Guide, or, OCG. This is provided for each course in every program. OCG is a major innovation to support disciplined community driven open e-learning. It is more detailed than OPG with the following functional components.

> (i) Course Header: It has the course code, course title, associated program, course coordinator and contact details, links to the Course Wiki area, Discussion forum and IPS. A significant add on is the Course Maturity Rating with a 5 * scale of rating that indicates how evolved the course is from the point of view of effective instruction delivery. Course community interactions and outcome based evaluation.
>
> (ii) The Course Events and related announcements. Assignments uploaded in the OCG may be downloaded from this component area.
>
> (iii) Approved and additional/supplementary learning materials that include IGNOU's self-learning materials for the course.
>
> (iv) Course objectives, outline and timetable.

(v) The Course Management and Study Plan (CMSP): This is an important instrument provided for the course community of program and course coordinators, counselors and the concerned students. CMSP effectively links each learning module related sequence of activities to the description of the concerned activity and the recommended resources that are to be used in performing the activity. A separate manual of CMSP is being prepared for this.

The Course Wiki area may be used to publish additional resources, video and multimedia content and annotations on the course content by anyone interested. The IPS area (explained in the next section) provides close interactions and utilities for coordination between the program and course coordinators, the counselors and coordinators of program study centres. Further the students may interact over open discussion forums and through the IPS. IPS has the facility of building up the FAQ that helps over time to provide answers to common queries. The OCG helps drive the TEOL system of instruction, learner engagements and evaluation as illustrated in Fig. 3.
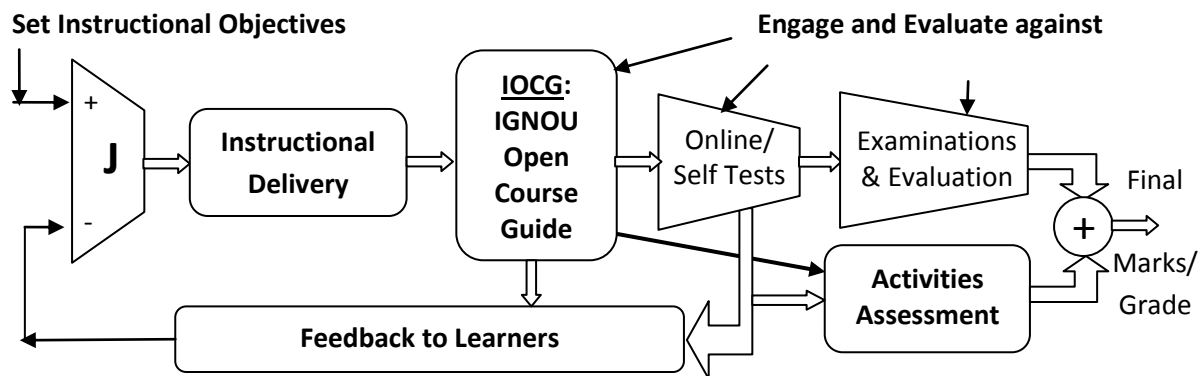

Fig. 3: TEOL's OCG system of Open E-Learning in Courses

The figure brings out the two major functional areas of education management in any course. On the left side is the feedback driven loop of instruction and learning support provided by the OCG's CMSP guided processes. The same CMSP also maps the activities of assessment and examinations that go into the system of evaluation illustrated on the right side of the figure. The Subject Matter Experts (SMEs) who are associated with the course content development should also contribute to the development of the CMSP.

A key feature in the CMSP is to guide quality learner engagements and map his/her efforts in terms of engagement hours. When this is taken together for all the learning modules, it formally and openly assures accreditation in terms of the number of credit units assigned to the course. In addition the CMSP leads to the justification of the quality of learners support and their engagements in terms of how well and closely they correspond to outcome based results. A system of Course Maturity Rating indicated in a 5* scale is being recommended. How this rating is assigned and justified by the SMEs who develop the OCG is being explained in a separate document on the CMSP. This is under development.

8

5. THE IGNOU PRASHNOTTARI SEWA (IPS)

In the learning processes and associated learner engagements as implied in Figs. 2 and 3 in the earlier section we need a support system for managing queries and interactions of several kinds. The discussion forums and course wiki, annotations on e-content and blogs support typical community driven open interactions. IPS has been developed to support the contextualized feed-forward and feedback interactions between the program and courses coordinators, Regional Centres, coordinators of program study centres, counselors and students in each course. Often such interactions take place between two persons or a person with a closed group. The IPS has been conceptualized to serve these needs. With the IPS, the community of the course instruction and management team, the learners and support persons from the Regional Services are well equipped to interact with each other in diverse ways. IPS supports the sequenced processes as may be implicitly stipulated in the CMSP. This helps in managing time-bound course activities and responding to concerns communicated by the members of the course community. The block diagram of the core IPS engine developed by the ACIIL team is shown in Fig. 4 on the next page. Typically IPS supports the following four categories of interactions in each program.

(i)   **Personal Queries from Students:** Any student in the program may visit its IPS page go to the relevant page and post his/her query. He/she may post an attachment with the query like requesting the program or course coordinator to go through a document or any clip. The query with the attachment is received by the designated Program Query Administrator (PQA). PQA may forward to the right person in the concerned school to get the reply and /or take necessary action. The student is given a token id that is to be used by him/her in the same page later to find out the response.

(ii) **Responder's Area:** The person who receives the query forwarded by the PQA uses this area to communicate the reply. If the query is of general interest, the responder may also forward a copy of the reply to the FAQ area supported by the IPS.

(iii) **FAQ Area:** The IPS provides open access to the Frequently Asked Questions, or, FAQ area for anyone to go through the responses for queries of general interest. FAQ area gets built up in due course as the IPS is used by more and more students over time.

(iv) **Circulars Issue:** This is of advantage to the program and courses coordinators for sending circulars or specific instructions, information on events or actions to be taken to the Regional Centres and through them to the concerned study centres. Copies of circulars issued are kept in a repository for a revisit.

(v)   **Students Surveys:** A program coordinator or course coordinator may post a survey questionnaire in this area and conduct a sample online survey of opinions on the questions asked to get a collective feedback from time to time.

(vi) **Contextualized SMS and Email Alerts:** This is an advanced technology service under development. Once deployed it will provide a powerful tool to interact with the unseen learners in directing them personally on learning activities.

The power of the IPS is that a single IPS server is capable of supporting the query management and FAQ building for hundreds of programs. It may also be adaptively interfaced to serve as query and messaging

system for the different divisions, schools, Regional Centres and any other entity of IGNOU. Basic version of this is undergoing trial deployment.
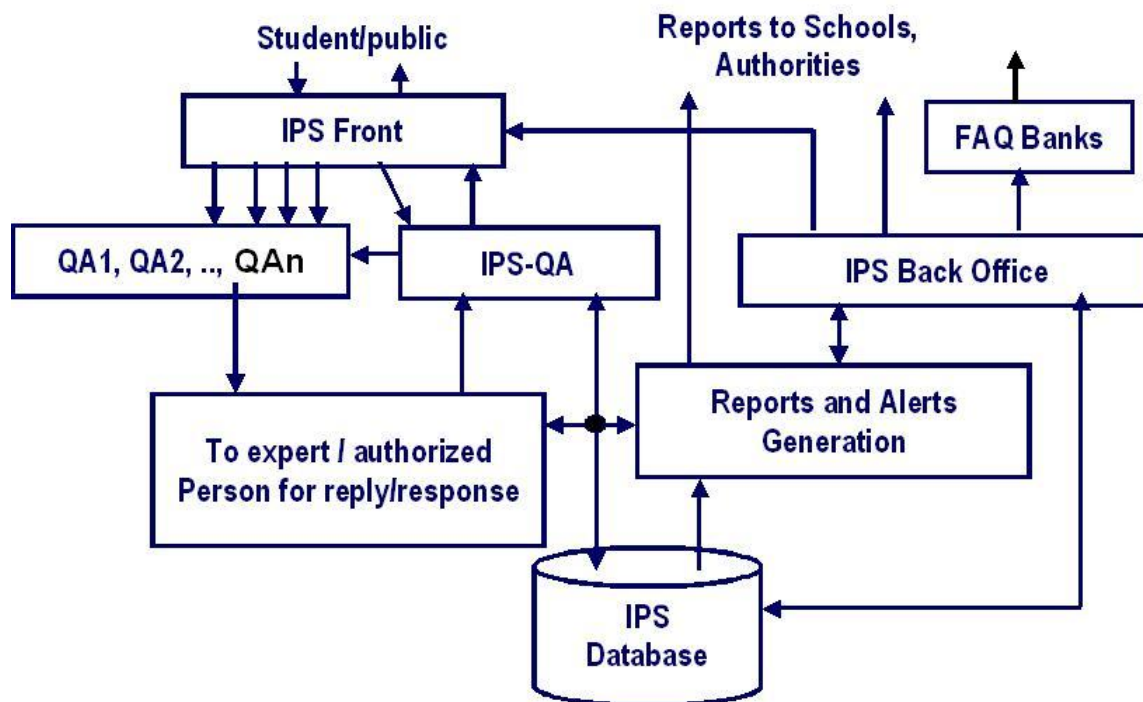

Fig. 4: The Core Engine Functions of the IGNOU Prashnottari Sewa (IPS)

Once commissioned, IPS will enhance IGNOU's quality of instruction delivery very substantially. Querying through IPS makes it accountable and makes the recipient entity responsible to respond. There are systems of alerts to escalate the level of the person to respond and mechanisms of report generation for query management. IPS brings the requisite tools for disciplined attention to the management of the TOEL system of course-specific social networking and makes the whole system into a community driven open e-learning platform.
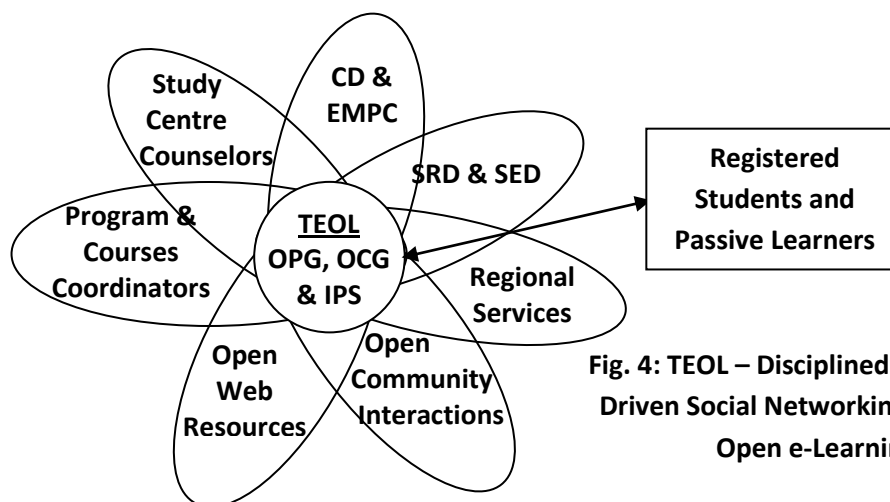

Fig. 4: TEOL – Disciplined Community Driven Social Networking System of Open e-Learning

10

With the IPS in place, we further illustrate in Fig. 4 how the introduction of TOEL brings in the coherence and coordination that are brought in by the adoption of TOEL. Fig. 4 illustrates how TEOL is to be viewed as a program-community driven disciplined social networking form of e-learning. The roles of each IGNOU wing associated with program management ranging from program development, registration, learning-engagements, support services, assessment and evaluation are centered on the learners. The learners too have provisions to carry out their own peer-to-peer learning activities over the open portal. TOEL facilitates such learners-centric ways of managing each program and its courses effectively through the system of OPG, OCG and IPS.

A major attraction of TEOL is that in its basic forms it uses license free 'Free and Open Source Software' (FOSS) in all its components. Work is on to make the key software part of the IPS published in the FOSS domain.

6. INTRODUCING THE COURSE MATURITY RATING

University education in India today has been largely reduced to the mediocrity of preparing students of mass university examinations. In such a situation, students are hardly motivated to think laterally and connect what they learn to related subjects or real world problems. This has resulted in entrenching mediocrity in education at the cost of excellence. Second deleterious effect of this form of university education is that good teachers are reduced to being spectators. Teaching to prepare students for external examinations vitiates the very purpose of teaching. Examinations should serve as measured feedback for learners to intuit their cognitive gaps in the topic concerned and give them guidance to take efforts in bridging the same.

Our Open University or ODL form of education no doubt is capable of providing good learning materials. However instruction is not information. It involves a judicious engagement of learners in alternating between well designed self efforts in study and problem solving and also in peer-to-peer interactions that bring out the capacity for articulation and critical thinking. So we may pose ourselves the question of how we impart instruction in an Open University that potentially matches the quality of instruction that happens in great universities of the world. Here we provide an innovative instrument under the TEOL that we refer to as the 'Course Maturity Rating' or CMR. CMR allows IGNOU's teachers and course writers to articulate pedagogy through the TEOL's Course Management and Study Plan (CMSP) and through the OPG and OEG with their linked processes of reaching out to the academic counselors and students through telecast, mobile and email alerts and Internet to guide their engagements in the designed learning and assessment scenarios.

An idea of how we may evolve a course with online support using CMR to achieve ever improving system of quality pedagogic engagement and assessment of learners is being attempted in the table on the next page. The CMR is indicated a 5* scale of rating. The higher the rating, the more we assure the quality of learners-engagements in the context of imparting knowledge. CMR may be evolved over time. Even 1* rating achieved will be much superior to the present low quality of learner engagements in the printed materials – contact classes type of system. IGNOU will have to reinvent itself to master the TEOL system of community driven form of open e-learning. The CMR based system provides the requisite

assurance for the same. An important byproduct of the CMR referenced TEOL system is that both accreditation worthiness and the mapping of credit units to engagement hours of learners are readily established. IGNOU has to adapt its established processes of 'phase forms' that govern new courses development to factor the TEOL CMSP and CMR system as well.

∗ ∗ ∗ ∗ ∗ : Contains Course Header with associated program(s), links to course wiki, discussion forum, basic IPS backed by program query administrator, course coordinator contact details, course prerequisites and course objectives.

∗ ∗ ∗ ∗ ∗ : 1* above plus downloadable and/or access to approved learning materials; online posting of assignments, course calendar.

∗ ∗ ∗ ∗ ∗ : 1½* plus instruction objectives for each block, links to additional resources like recommended video lectures as deemed fit and basic course management and study plan.

∗ ∗ ∗ ∗ ∗ : 2* plus Course Management and Study Plan (CMSP) with active IPS support system to engage the learners as per the declared calendar of events. CMSP should declare the sequence of learning activities / engagements of the learners. Support to academic counselors will be provided through IPS and mobile services; Timely completion of assignments and marks postings.

∗ ∗ ∗ ∗ ∗ : 2½* plus refinement of the CMSP to include pointers to supplementary resources that help learners broaden their understanding; Introduce contextualized SMS, announced telecast and webinar sessions; Build Online self tests like the 'Did I get it?' as in the CMU's OLI system to help learners in their study; support to study centres and academic counselors through TEOL for course events and contact classes; timely completion of projects reports evaluation and posting.

∗ ∗ ∗ ∗ ∗ : 3* plus assured conduct of practical sessions, design exercises and term papers; Timely evaluation of answer scripts and term papers.

∗ ∗ ∗ ∗ ∗ : 3½* plus engagement of learners through TV based seminars, and/or webinars with interactions.

∗ ∗ ∗ ∗ ∗ : 4* plus 'Tutored Video Instruction' mode of education and contact classes in the study centres; Introduce web-based mentoring/proctoring system; online systems supported testing and evaluation system with associated learners database management; assured engagements of learners in at least 70% of the CMSP stipulated activities.

∗ ∗ ∗ ∗ ∗ : Outcome based education through assured engagement of the learners to apply the skills and concepts taught in the course. At least 50% of the class should be able to exhibit the basic outcome expected from the course, We may add a course-end Workshop to showcase the term papers or projects done by the learners during the course.

7. COMMISSIONING OF TOEL AND IPS FOR ALL IGNOU'S PROGRAMS

TOEL is built as a system with processes that use a suite of linked applications and services that run over the LAN and the Internet. It is a system that is well aligned with the existing IGNOU's open approach to education as a people's university. The ACIIL team has implemented the whole suite of systems behind the TEOL through the technology and practices of using cloud servers with virtualized systems and networking. Thanks to the industries - HCL and Sun Microsystems - offering their servers for experimental developments and training, the team managed to establish a small cloud facility in which these developments could be hosted and pilot services launched. IGNOU's Computer Division is in the process of procuring a mini-datacenter and major cloud servers to serve the medium term needs of IGNOU. It is hoped that these will come in the next several weeks. With the TOEL suite of applications and IPS shifting to these cloud servers, we shall be in a position to commission the same formally for all the programs of IGNOU.

Already about 28 programs with about 200 courses have commenced the TOEL system of OPG and OCGs. TOEL is not just about mechanizing the existing IGNOU's ways of conducting education or provide a platform like an LMS to conduct course related processes with asynchronous interactions. The CMSP imbedded into the TOEL system allows for formal system of online open courses from IGNOU. Presently any school or centre may launch the TOEL services by sending an email to aciil@ignou.ac.in. Concerned ACIIL staff will assist the requesting faculty in commissioning the TOEL services for the respective programs.
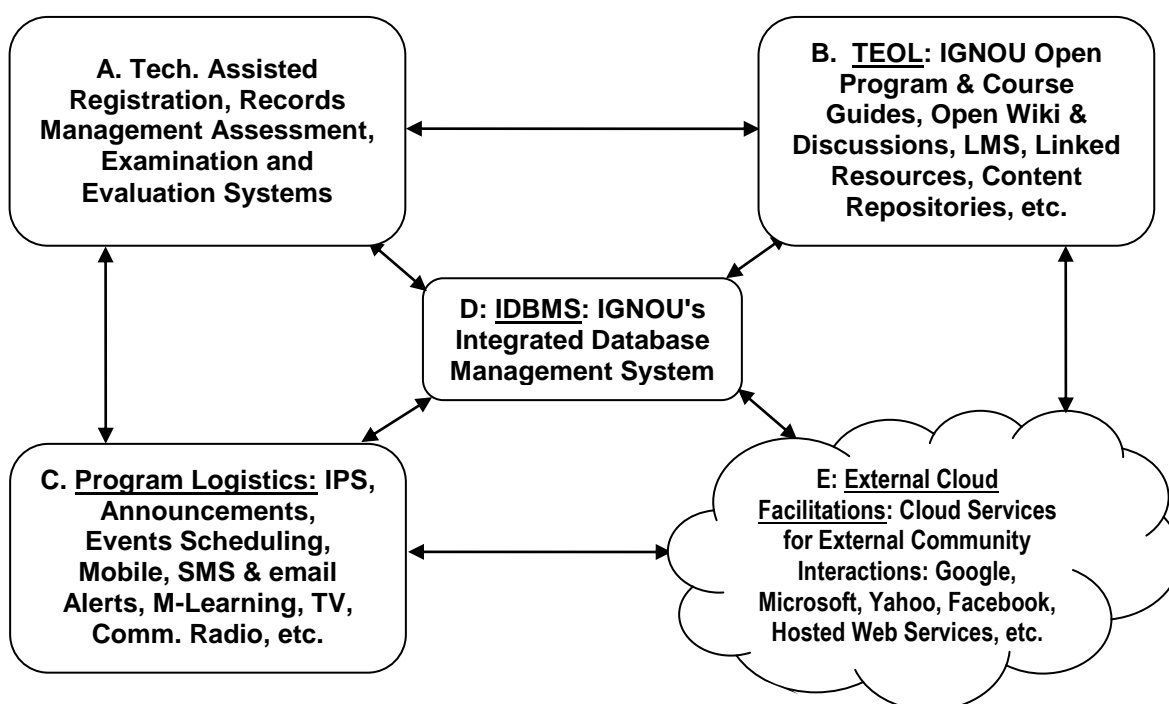

Fig. 5: Component Groups of Services in the total TOEL Framework of IGNOU

A total picture of the major areas that will be required and/or involved for bringing the requisite ICT enabled processes and education support in IGNOU is outlined in Fig. 5. The different blocks shown in There is a need to realign the roles of the different services divisions and some of the functions of schools to align with the areas shown in Fig. 5. This will evolve over time. Each of the components in Fig. 5 is briefly delineated below.

A. **Technology Assisted Registration and Records Management:** The existing entities like SRD and SED will manage these functions. However they will have to introduce modern systems and practices to ensure coherence, error free and timely attention to the processes. These require several new developments in systems and processes.

B. **TEOL:** This has been developed by a coordinated effort by the ACIIL team working with several faculty members and staff across IGNOU. This will continue to evolve for some years to come and should keep pace with the changes in the ICT scenario.

C. **Program Logistics:** Each IGNOU program and even each of the courses ion the program have to define its own systems and processes of learners engagement and management dynamically. Accordingly we need to align or tune and manage the component systems of TEOL to suite its requirements. This will be done by the services of a core **'Advanced Technology, Informatics and Convergence Services (ATICS)'** group that is to be proposed to be established under the ACIIL. The same ATICS will also support the technology evolution in the TEOL.

D. **Integrated Database Management Services (IDBMS):** This is the most critical one as it links the diverse services through the metadata associations between the defined activities.

E. **External Cloud Facilitations:** With increasing free and subscribed cloud services and web resources of value for education available from different sources like Google, Microsoft, NPTEL, various scientific databases, social networking, mobile services gateways, etc., there are many open opportunities for IGNOU's programs to link with them and provide rich environment for the learning engagements and courses development. However these require disciplined web 2.0 constructs, mash-ups and linkages with IGNOU's own private cloud services. These will be supported under the TEOL.

The challenge of total ICT facilitation of IGNOU for the emerging times consists of coherently commanding and managing the developments of five major groups of systems and the services they support as illustrated in Fig. 5. To master the scenario and management of the different functions in the different blocks of Fig. 5 we need to realign the roles of the different concerned divisions, bring in new capabilities and add to competencies at various levels in our existing schools, centres, divisions and the network of our study centres. TOEL provides the foundations to commence this process of transformation in ways that preserve the distinct IGNOU's system of ODL. How this is to be achieved is stated in Section 6. For the present, we are ready to launch and service the first cut version of TOEL in right earnest.

All the Schools and Centres of IGNOU and those who coordinate the programs with partner institutions are hereby invited to commence the TOEL enabling of their respective programs and courses. We shall continue to evolve the TEOL suite of systems keeping pace with global technology developments and IGNOU's requirements.

Several TOEL related orientation workshops and seminars are being planned in the days ahead. All academic staff of IGNOU and its Regional Centres are welcome to 'TOEL enable' their programs and courses. Those who provide the services related to the education programs like the Regional Services, PDD, MPDD, SRD, SED and SSC will also benefit much by attending these workshops. Assistance from STRIDE, IUC and experienced faculty members is being taken to come with the necessary operations manual user guidelines. These will include necessary redrafting of the existing Phase Forms so that the upgraded processes are made formal and integrated into IGNOU's processes of launching and maintaining the programs and the courses. TOEL opens up a whole new generation of instruction delivery and learning management possibilities and opportunities for all in IGNOU.

7. A POSTAMBLE WITH ACKNOWLEDGEMENTS

There is a chronology of developments and lessons from experience behind the conceptualization and implementation of the TEOL. The seeds originated in IIT Kanpur in 1998-2000 where the first LMS was commissioned. They were further taken to Kerala through the IIITM-K in the Education Grid developments. In parallel, the author's experience from the NPTEL developments gave much insight into ICT related deployment of courses. In several ways the author acknowledges the many academicians and professionals who were associated in these developments. LMS systems were extensively used and further developed in IIITM-K from its very beginning in 2001. These helped understand its strengths and limitations. Specific mentions in these developments are given to Arvind Mohan, B.V. Lakshmi, Pradeep Kumar, Ajith Kumar, Radhakrishnan, Dr. T.K. Manojkumar and David Mathews in the IIITM-K days of gestation. TEOL has taken the development of Education Grid further. The Wiki concepts were initiated by Dr. T.B. Dinesh, visiting faculty of IIITM-K and Dr. C. Venkatesh of IIITM-K way back in 2005. The experience in the interactive social networking system of engaging learning communities arose from the several portals that were developed and serviced by IIITM-K. On the NPTEL side special mention is made here of interactions with Prof. Mangala Sunder Krishnan, Prof. M. S. Ananth, Prof. Kannan Moudgalya and Prof. A.K. Ray in organizing large scale management of developing quality content and attention to pedagogy. The author benefited from the interactions with each and every member of the PIC of NPTEL.

On the IGNOU side special acknowledgements go to Prof. V.N. Rajasekhran Pillai, Hon. VC for inviting the author, giving the freedom and support through necessary approvals to establish the seed development team and to synthesize the different sub-systems of TEOL. The core technology coordination in these developments was provided by the three systems and software professionals and consultants – Sukant Kole, Rejith R. Nair and Divya Raj. Under their supervision about 10 fresh graduates were trained and employed on contract to build the several systems and support the services. The three reached over to key technical staff in Computer Division, SRD, SED and several faculty members in the schools. They did much to reorient and train many of IGNOU faculty and staff in moderns IT systems, networking and wiki related skill sets. They led a co-synthesis model of systems, software developments, integration and deployment. Two sister development to this has been the commencement of the IGNOU Wiki services were the IGNOU Wiki that hosts dynamic pages of several divisions and schools, and the DEP-SSA Wiki with Dr. Nisha Singh Divya Raj, Sukant Kole and Vivek Ranjan taking it further and using it for school teachers training.

The Directors and Heads of different divisions and schools have extended their cooperation whenever solicited. On the side of IGNOU we received much support from Dr. Madhu Parhar, Shri Akshay Kumar, Shri P.V. Suresh, Dr. Manohar Lal, Dr. Vijay Srivastava, Dr. Lalita Kumar in particular, and the entire team of the faculty members of SOCIS. The proposed TEOL direction of open e-learning is being appreciated

and increasingly adopted by several faculty members in various schools. Due acknowledgements are hereby given to all those who associated with these developments. Specific mention is also made here of Prof. Paul Goodman of CMU on his discussions with the author and emphasizing building the feedback driven learner engagements in the open university education perspective and that of Prof. M.S. Vijay Kumar whose interactions on MIT OCW developments and correlating with Education Grid helped shaping the social networking features into the TEOL.

With the new cloud servers under procurement by the Computer Division and TEOL installed and serviced using them, IGNOU will be ready to take on the next generation ICT enabled systems and practices over the coming years. There are several dimensions to the totality of systems and practices that will evolve over time under the TEOL. Accordingly we shall come up with supplementary papers to that help master the TEOL by all concerned. If we in IGNOU command this system of community driven open e-learning, it has the potential to seed the transformation of India's education from being mass exams centric to the much more desirable learning centric and outcome oriented system of education.

[K.R. Srivathsan]

Aug. 02, 2010

References
1. K.R. Srivathsan, "Invitation to ODTEL", circulated paper to all in IGNOU and available for download from the IGNOU Wiki.
2. Toru Iiyoshi and M.S. Vijay Kumar (Editors), "Opening up Education", Book published by MIT Press, 2008. Also available for download under creative commons license.
3. Related publications and presentations on ODTEL may be found in the ODTEL Publications in the IGNOU Wiki and the Education Grid portal (www.edugrid.in) of IIITM-K.